

MISSOURI CONSERVATIONIST

VOLUME 79, ISSUE 5, MAY 2018
SERVING NATURE & YOU



HIKING is a great way to get out and discover nature. It's good for your health, and can be enjoyed by people of all ages and ability levels.

- ▶ Wear comfortable shoes, and plan to layer your clothing.
- ▶ Bring a camera, binoculars, and field guides.
- ▶ Pack water and a light snack, like pecan-orange granola.
- ▶ For places to hike near you visit mdc.mo.gov.



DISCOVER NATURE



pecan-orange granola

Makes a generous gallon

- 8 cups rolled oats
- 2 cups coarsely chopped pecans
- 2 cups raw sunflower seeds
- 1 cup sesame seeds
- 1 cup shredded unsweetened coconut
- 1 teaspoon salt
- 1 cup honey
- $\frac{3}{4}$ cup vegetable oil
- 1 teaspoon almond extract
- Juice and zest (chopped) of 4 oranges
- 2 cups chopped dried fruit

Preheat oven to 350°F. In a large mixing bowl, toss together the oats, nuts, seeds, coconut, and salt. Over low heat, warm the honey and oil in a medium saucepan, stirring until well combined. Remove from heat and stir in almond extract and orange juice. Pour over the dry ingredients and stir well with a wooden spoon. Work the mixture with your hands, if needed, until everything is damp.

Spread mixture no deeper than $\frac{1}{2}$ inch on large, rimmed baking sheets. Bake for 30 to 40 minutes, stirring several times, until crispy and golden. When the granola has cooled, stir in the zest and dried fruit. Store granola in jars.

Find more wild recipes in *Cooking Wild in Missouri*. Order yours at mdcnatureshop.com.



Contents

MAY 2018
VOLUME 79, ISSUE 5



FEATURES

10 Protecting Missouri Turtles

New regulation eliminates commercial turtle harvesting.

by Angie Daly Morfeld

14 Eating Close to Home

Locavores put emphasis on foods' origins.

by Larry Archer

22 Halting the Horrible Hydrilla

A new invader threatens Missouri waters and fisheries.

by Bill Graham

DEPARTMENTS

- 2 Inbox
- 3 Up Front With Sara Parker Pauley
- 4 Nature Lab
- 5 In Brief
- 28 Get Outside
- 30 Places To Go
- 32 Wild Guide
- 33 Outdoor Calendar



Monarch
caterpillar on
milkweed

MISSOURI CONSERVATIONIST



ON THE COVER

A common snapping turtle at Squaw Creek National Wildlife Refuge.

📷 **NOPPADOL PAOTHONG**

17-40mm lens, f/5
1/250 sec, ISO 400

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STEM AND NATURE

Thank you for *Nature Lab* and *Wild Guide*, which show the STEM aspect of technology intersecting with biological sciences. Great opportunities to show innovation in other disciplines. Keep up the good work.

Cammy Neth
Liberty

LOVE FROM ALASKA

My brother in Independence gave me a subscription to the *Missouri Conservationist*, which I thoroughly enjoy each month. Alaska has an online edition, but it is nothing to match the *Missouri Conservationist*. Having grown up in Missouri and received my zoology degree from the University of Missouri many years ago, the *Conservationist's* articles are of particular interest to me as a hunter, fisherman, and ecologist.

Robert O. Baker, PhD, Cdr. USN (ret) Anchorage, AK

CONSERVATIONIST: YEARS OF MEMORIES

For decades we have subscribed to the *Missouri Conservationist*. When friends have babies, we subscribe for them to receive this magazine. Every home should have the knowledge and interest cultivated and supported through the Missouri Department of Conservation. I love the photos, many of which I have used as watercolor inspiration. I enjoy everything about the magazine, from the vivid, glossy covers to the informative calendar on the back page, which I post monthly on our information bulletin board at work.

Recently, my daughter and her family moved to San Antonio, TX. I immediately contacted Texas Parks and Wildlife, so they could receive the Texas equivalent to the *Missouri Conservationist*. I was disappointed to learn there is a fee for the subscription. How lucky we are to have the *Missouri Conservationist*!

Susan Wolff Ballwin

Great job on the magazine! Keep up the great work. Every month I read it from cover to cover and sometimes again. Great Missouri information, wildlife information, and photos. Enjoyed this magazine for years. Thanks for the great experiences.

Ronnie Oloyed Dittmer



Woodhouse's toad

TOADS

The Secret Life of Toads in the April issue brought back a fond memory that I hadn't remembered in a long time. When I was growing up on a farm in Scotland County, we milked cows by hand morning and evening in an old barn. Every year, a solitary toad appeared near the milking area and hung around for several weeks. He was unfazed by all the activity, and our dog and cats never bothered him. He just went about his business. I suppose there were enough flies, crickets, and beetles to keep him fed. We always wondered if it was the same toad every year, and now that I've read the article, which said they can live up to 12 years, I'm sure it was! I just don't know where he spent the rest of the year, how he managed to survive the brutal winters, or whether he ever found a mate. Of course, maybe he was a she. Thank you for jogging my memory.

Denise Howard Santa Clara, CA

OH DEER!

I have read the suggestions in the February issue [*Oh Deer, Some Bunny Ate My Veggies!* Page 22] about how to keep deer out of a garden, along with those in April's edition of *Inbox* [Page 2]. This is what worked for me last year and I'm going to do it again this year. I put two lines of masking tape about 6 or 8 inches apart around the top of the fence. It messes with their eyes, and they won't try to jump the fence.

Joy Boyer email

JIM RATHER

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on your Instagram photos.



1

1 | Mingo Swamp
by John Sawhill,
via Flickr

2 | Armadillo by
afiercegreenfire,
via Instagram

3 | Prairie lizard
by Meghan
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email



2



3



4

4 | Robin's nest by
angela_l_layman, via
Instagram

MISSOURI CONSERVATION COMMISSIONERS



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Bedell



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Murphy



Up Front

with Sara Parker Pauley

✳ One Sunday night recently, with snowflakes still falling and the wood stove churning out warmth, some friends came over for dinner to discuss preparations for turkey camp. It's our annual tradition to circle the RVs, gather around the campfire (dogs included), scout for turkeys, and celebrate the start of spring turkey season. We also planned our menu for turkey camp, including salivating at the thought of finding some tasty morel mushrooms in the woods while hunting.

All the talk of food that night, including our dinner of fresh bass caught from my cousin's pond, took me back to summer trips to my paternal grandparents' house. I've written before about my maternal grandmother, Granny Elma, but I was also blessed with amazing paternal grandparents. My Nanny was a beloved first-grade teacher with a creative, joyful spirit. She was a naturalist at heart and loved to spice up meals with greens, such as sautéed curly dock or watercress salads. We'd even occasionally get flash-fried red clover blossoms or daisies as appetizers.

For many, the experience of collecting wild edibles and harvesting game provides nourishment for the body, but it also provides a chance to fill our lungs with fresh air and reconnect with the land. The allure of a more personal connection with nature is evidenced by the rise of the locavore movement (see *Eating Close to Home* on Page 14).

May you experience the joy of connecting with the bounty of the land this month, whether you're bird watching or bass fishing or morel gathering. What's good for the body is also good for the soul.

Sara Parker Pauley

SARA PARKER PAULEY, DIRECTOR
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Printed with soy ink



mdc.mo.gov 3

Nature LAB

by Bonnie Chasteen

Each month, we highlight research MDC uses to improve fish, forest, and wildlife management.

RESOURCE SCIENCE

Hellbender Recovery

✱ “Hellbender” is the common name for *Cryptobranchus alleganiensis*, a large, seldom-seen aquatic salamander native to the rocky, cold-water streams of the Ozark Highlands.

“Hellbenders have dramatically declined over the past 40 years in Missouri, with a prominent shift in age structure towards large, mature individuals with young age-classes virtually absent,” said Missouri State Herpetologist Jeff Briggler. “Historic population estimates were over 45,000 animals. Today less than 2,300 are known from the wild in Missouri.”

Briggler said a multitude of factors have likely influenced hellbender populations. Chief among these are habitat alteration and degradation, disease, illegal harvest and disturbance, and predation. “Declines are likely due to a cumulative effect of these factors,” Briggler said.

In order to slow the hellbender’s decline and address the potential threats facing this animal in Missouri, Briggler and other partners are leading recovery efforts. His partners include researchers, state and federal agencies, the Saint Louis Zoo, and private citizens.



MDC and St. Louis Zoo staff release captive-reared Ozark hellbenders into their native Ozark river.

Partners are working to restore this endangered aquatic salamander in Ozark streams

Some of the recovery team’s most significant progress has involved breeding and rearing young hellbenders at the Saint Louis Zoo and an MDC hatchery.

“Consistent captive-breeding of the species for six consecutive years at the Saint Louis Zoo and rearing of young obtained from eggs collected from the wild has resulted in over 5,000 animals released back into their native river,” Briggler said.

Captive-breeding achievements will not only buy time for the team to further address the species’ decline, but they will likely be the safety net needed to save this unique native species of the cold-water streams of the Ozark Highlands.

Hellbenders at a Glance



Historic population and range in Missouri

Estimated at over 45,000 in rocky Ozark streams, but less than 2,300 remain.

Their role in Ozark stream ecosystems

Predator, mainly of crayfish. Prey of larger fish, and some mammals.

How they breathe

Numerous fleshy folds along the sides of the body provide surface area for respiration under water.

How long they live

25-30 years in the wild.

Reproductive age

5-8 years, and males normally mature at a smaller size and younger age than females.

Who guards the eggs and larvae

Male hellbenders protect eggs and recently hatched larvae from predation.



TOP: INSET, BOTTOM LEFT: JEFFREY T. BRIGGLER; HELLBENDER EGGS: MARK WANNER, ST. LOUIS ZOO; HELLBENDER: NOPPADOL PAOTHOONG

In Brief

News and updates from MDC



THANK YOU FOR SHARING THE HARVEST

DONATED DEER MEAT
GOES TO LOCAL
FOOD BANKS AND
FOOD PANTRIES

➔ Thousands of Missouri deer hunters donated 289,292 pounds of venison to the state's Share the Harvest program this past deer season. The donated deer meat will help feed hungry Missourians all around the state.

Since the program was started in 1992, Share the Harvest has provided nearly 4 million pounds of lean, healthy venison to feed hungry Missourians — including this year's donations and 198,277 pounds of venison donated the year before.

Share the Harvest is coordinated by MDC and the Conservation Federation of Missouri (CFM). Deer hunters donate their extra venison to more than 100 participating meat processors throughout the state who grind the deer meat into ready-to-use packages. The packaged venison is then given to local food banks and food pantries for distribution to Missourians in need of food assistance.

"Hunters started Share the Harvest because they saw a need in their communities," said MDC Director Sara Parker Pauley. "And hunters remain the driving force behind this popular program that helps feed our fellow Missourians who are in need. We sincerely thank the thousands of deer hunters who support Share the Harvest, along with the many participating meat processors and sponsors."

Processing fees are covered entirely or in part by numerous local supporting organizations and statewide sponsors, which include: MDC, CFM, Shelter Insurance, Bass Pro Shops, Missouri Chapter Safari Club International, Missouri Chapter National Wild Turkey Federation, MidwayUSA, Inc., Missouri Food Bank Association, and United Bowhunters of Missouri.

For more information on Share the Harvest, visit short.mdc.mo.gov/Zoz.

TRIM GRANTS HELP WITH COMMUNITY TREE CARE

MDC, in cooperation with the Missouri Community Forest Council, is administering Tree Resource Improvement and Maintenance cost-share grants. The grants, known as TRIM, can help government agencies, public schools, nonprofit groups, and communities pay for community tree care through tree inventories, removal or pruning of hazardous trees, planting trees, and training volunteers and city/county employees to best care for community forests.

"By accessing these cost-share grants, Missouri communities can do more to take care of their trees," said MDC Community Forestry Programs Supervisor Russell Hinnah. "TRIM grant recipients focus on keeping their neighborhood trees healthy and thriving, which translates to a whole host of social, economic, and environmental benefits for the community and the state. Properly caring for your community's trees helps make your town safe and beautiful."

The program provides reimbursements of \$1,000 to \$10,000 to fund up to 60 percent of a project. Projects located in communities with the Arbor Day Foundation's Tree City USA designation are eligible for an additional 15 percent in matching funds.

The deadline for TRIM grant applications is June 1. For more information and the grant application, visit mdc.mo.gov/trim.

NEW ONLINE AUCTION

MDC now offers used vehicles, boats, motors, tractors, trailers, farm equipment, office equipment, and other items for sale through govdeals.com, an online auction website exclusively for government and educational agencies.

The site is available 24/7 from the convenience of a computer or smart device. It replaces the semi-annual live auctions held in June and October at MDC's Maintenance Center in Salem.

"Our move to all-online auctions with offerings posted throughout the year makes it easier and more convenient for many people to see, bid on, and buy items offered by the department," said MDC General Services Supervisor Jeff Arnold, who coordinates the auction activities. "It also provides significant time and cost savings for MDC by eliminating the need to transport items from throughout the state to the Salem Maintenance Center, prepare each item, advertise, and staff the live auctions."

To find auction items available, go to govdeals.com and enter "Missouri Department of Conservation" in the search box. Auction items are posted throughout the year as they become available.

Ask MDC

Got a Question for Ask MDC?

Send it to AskMDC@mdc.mo.gov
or call 573-522-4115, ext. 3848.

Q: Recently, a red bat has taken up residence in a small space between our house and the corner post of our carport. We haven't disturbed it, but it hasn't moved either. Is this normal?

➔ It sounds as if this bat has chosen this space for its summer daytime roost. The habits of bats vary from species to species, but it's not unusual for them to secure themselves in a protected spot — such as this snug location. They also like loose tree bark, hollow trees, rocky crevices, and other protected places, such as underneath shingles and siding.

They spend their days roosting and their nights foraging. A tree-dwelling species, red bats start to feed on flying insects at dusk and continue into the night. Bats tend to forage along the edges of forests and fencerows, and they're also seen over ponds and meadows and around city streetlamps.

If this bat is not bothering you, you can leave it alone. If you don't want it in the same crevice next season, you might seal it this winter. We would also encourage you to erect a bat house. To learn more, visit batcon.org or batconservation.org.

Bats are beneficial creatures



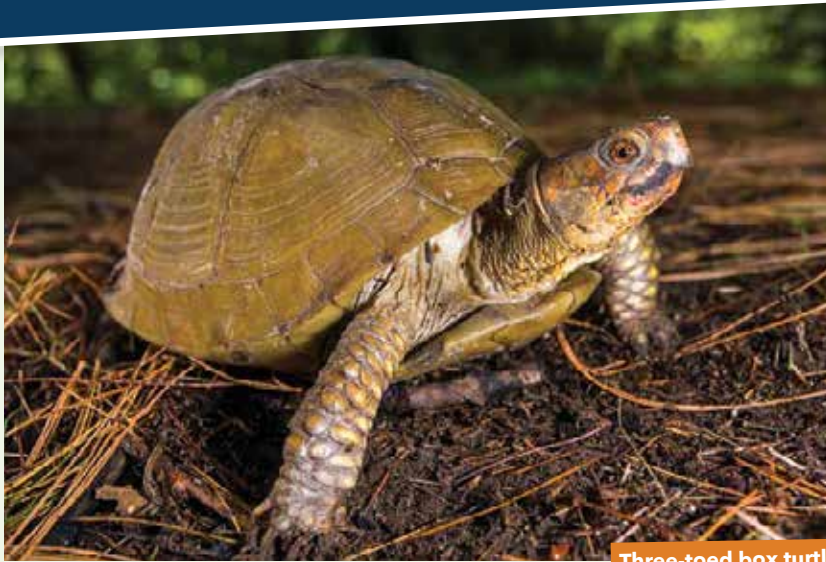
Red bat

that provide invaluable services to both natural ecosystems and humans worldwide.

Q: Is it legal to take three-toed box turtles from the wild and keep them as pets?

➔ Missouri residents interested in learning more about the fascinating behavior of box turtles can possess this species without a permit.

However, we caution against making a box turtle a long-term pet since they can live well over 50 years. If you plan to keep one longer than a week, please be mindful of what it needs to remain healthy. Box turtles are quite fragile in captivity and are not easy to maintain long-term. Without proper sunlight, fresh water, and a nutritious diet, they are prone to developing respiratory and eye infections. A large outdoor pen with morning sun and afternoon shade is the best way to keep them during the summer months. Once adopted



Three-toed box turtle

for an extended period, a box turtle cannot be successfully returned to the wild. For more information about box turtle care, visit short.mdc.mo.gov/Zqp.

If you remove a turtle briefly from the wild to study it, please return it to its original location. Box turtles depend on familiar habitat to find food and shelter. They also have a strong urge to return, which can lead to them being killed on the road.

Although there's no indication three-toed box turtles are declining in Missouri, turtles generally have

been declining statewide, mainly due to loss of habitat, vehicle strikes, and poaching. During this time of year, many turtles are seen crossing roads and many are run over accidentally. Please be alert to these animals. If you want to help them cross, first ensure the safety of humans and then move the turtle in the direction it was traveling.

For a complete understanding of the rules related to the confinement of native species, please consult the *Wildlife Code of Missouri*.

AGENT ADVICE

from

Jason Langston

OREGON COUNTY
CONSERVATION AGENT

May is traditionally the start of summer, and what better way to kick it off than on the water with family and friends. Missouri is a great place to fish, so grab your pole before heading to the water. Check local regulations for the body of water you're visiting and pack the proper baits and lures. Catch-and-release is a fun way for young kids to experience fishing and conserve the resource. If you want to enjoy the water from a canoe, kayak, or boat, don't leave shore without proper life jackets. Have a picnic on a gravel bar — there's nothing better on a warm summer day. Do your part to keep the rivers clean and pick up any trash you see. See you on the water!



What IS it?

Can you guess this month's natural wonder?

The answer is on
Page 9.



WE ARE CONSERVATION

Spotlight on
people and partners

CCLS's Green Team

Katie Clark's children attend Christ Community Lutheran School (CCLS) in Webster Groves. As a parent, she enjoys working with students, other parents, teachers, and administrators on the school's Green Team.

Learning to be Green for Life

The CCLS Green Team participates in a number of Gateway-area projects, including the U.S. Green Building Council – Missouri Gateway Chapter Green Schools Quest, LEAP (a program of EarthWays Center, a division of the Missouri Botanical Garden), and No MOre Trash, a partnership between the Missouri departments of Conservation and Transportation.

In Their Own Words

Speaking for the Green Team, Clark said, "Little choices make a big difference. We found that by making small tweaks to the way students disposed of their lunch waste, we would divert literally tons of debris away from the landfill and into recycling. Given the many terrific resources available to help, making a sustainable difference is actually manageable, teachable, and fun."

by Dan Zarlenga



What's **your** conservation superpower?



Did You Know?

Missouri has more than **1 million acres** of surface water, and most of it provides **great fishing.**

More than **200 different FISH SPECIES** are found in Missouri.

>20 are game fish.

FREE FISHING DAYS

Looking for a fun way to get family and friends outside to enjoy nature? Get hooked on fishing with our annual Free Fishing Days June 9 and 10. During Free Fishing Days, anyone can fish in the Show-Me State without buying a fishing permit, trout permit, or trout park daily tag.

Other fishing regulations remain in effect, such as size limits and number of fish an angler may keep.

Special permits may still be required at some county, city, or private fishing areas. Trespass laws remain in effect on private property.

Conservation makes Missouri a great place to fish, and Free Fishing Days encourages people to sample our state's abundant fishing opportunities. Get more information on fishing in Missouri from *A Summary of Missouri Fishing Regulations*, available where permits are sold and online at huntfish.mdc.mo.gov/fishing.

WHAT IS IT?

Because it reaches a fairly large size and is readily caught, white crappie (*Pomoxis annularis*) ranks as one of Missouri's most popular panfishes. Crappie anglers enjoy great success bank-fishing or slow-trolling with small minnows near submerged trees or other cover. White crappie is more abundant and widespread than its close relative species, the black crappie.

Photograph by Noppadol Paothong

WHITE CRAPPIE





An adult spiny
softshell turtle captured
in a hoop net.

PHOTOGRAPH BY
JEFFREY T. BRIGGLER



PROTECTING MISSOURI *turtles*

NEW REGULATION ELIMINATES COMMERCIAL TURTLE HARVESTING
by Angie Daly Morfeld

Missouri is home to 18 species of turtles. Although turtles have been around for years, they are losing ground to land conversion, draining of wetlands, and channelization of rivers, which have replaced their preferred habitat — swamps, marshes, and meandering streams. Poaching and congested roadways put added pressure on these ancient and important creatures. Add to this the commercial harvest of certain species of turtles — especially mature adults — to serve the demand in foreign markets, and it becomes clear why their populations are vulnerable throughout many regions of the world.

To help reverse this trend, MDC took an important step.

COMMON SNAPPING TURTLE



SMOOTH SOFTSHELL TURTLE



SPINY SOFTSHELL TURTLE



RECREATIONAL HARVEST: LIMIT CHANGE

Although it is now illegal to harvest common snapping and softshell turtles for commercial use, it is still legal to take these three species in limited numbers for personal consumption. However, effective March 1, 2018 the daily limit for common snapping and softshell turtles was reduced from five each to two in the aggregate. The seasons and methods will remain the same — common snapping turtles may be taken throughout the year and softshell turtles from July 1 through Dec. 31 with hand or lines.

"Limited data exists on the number of turtles harvested via sport fish license," Briggler said.

Based upon interactions with anglers and public input during MDC's 80th anniversary open houses held across the state in 2017, very few individuals reported harvesting turtles for food.

"On average, 1.2 million anglers annually possess a fishing license and could potentially harvest turtles. That means annual harvest of turtles using sport fish methods could be very high," Briggler said. "This reduction still allows individuals who enjoy eating turtle meat to possess these turtle species for food while ensuring long-term sustainability of the turtle resource of the state."

Commercial Harvest Closes

On March 1 of this year, Missouri joined many other states when it closed the commercial harvest of common snapping (*Chelydra serpentina*), smooth softshell (*Apalone mutica*), and spiny softshell (*Apalone spinifer*) turtles.

"From habitat loss and degradation, disease, mortality from road traffic, increased predation, water pollution, and harvest for food, medicines, and the pet market, turtles are constantly battling for their lives," said Missouri State Herpetologist Jeff Briggler. "Elimination of commercial turtle harvest was needed to protect the long-term stability of turtle populations in the state."

Prior to this regulation change, the *Wildlife Code of Missouri* allowed the harvest and possession of common snapping, smooth softshell, and spiny softshell turtles in any numbers throughout the year. Turtles could be taken from flowing portions of the Missouri and Mississippi rivers and the portion of the St. Francis River that forms the boundary between Arkansas and Missouri using commercial methods.

Commercial turtle harvest is considered one of the most important influences on turtles' population declines worldwide, Briggler said.

"Most turtle species lay less than 20 eggs annually, and of those, less than 25 percent even make it to a juvenile stage," Briggler said. "Then female maturation may take up to 10 years, depending on the species, which makes the replacement rate of just one turtle hard to come by. With limited egg production, there's just no way to compensate for the removal of reproductive adults."

Due to their hard, protective shell, turtles have few natural predators once they reach adult size. Therefore, turtles can be easily overharvested from a location and it can take decades — if not multiple decades — for the reduced population to rebound.

A Three-Year Study

To better understand the effects of commercial harvesting on the turtle population and to determine if regulation changes were necessary, MDC, in cooperation with the University of Missouri-Columbia, initiated a study in 2010. For three years, researchers conducted mock harvests on commercial waterways and compared that data with mock harvests conducted on noncommercial waterways. During the study, researchers acted as mock harvesters, using the same methods as commercial harvesters to collect species of turtles.

Turtle poaching has been and continues to be a threat to Missouri's turtle population, as demonstrated by this conservation agent, who has confiscated a net full of illegal turtles. Many turtles are shipped to overseas markets for food, pets, and medicinal purposes.



HERE'S WHAT YOU CAN DO TO HELP

- ➔ Don't adopt or buy turtles for pets. They require special care and can live well over 40 years.
- ➔ Don't shoot turtles for sport. It's illegal, and it pressures an already stressed group of animals.
- ➔ Report turtle poachers to Operation Game Thief toll-free at 1-800-392-1111.
- ➔ Be careful when you drive, especially in spring and summer when box turtles are mating, nesting, and dispersing. If you can do so safely, stop and help a turtle cross the road. Always move the turtle in the direction it is headed.
- ➔ Create habitat areas around your home or farm. These include wetlands and wooded, shrubby, and grassy natural habitat.

The numbers harvested were then calculated to obtain the abundance of turtles, proportion of turtles harvested, and to model the effects commercial harvesting had on river turtle populations.

Results showed that common snapping turtle populations were significantly lower in harvested areas, like the Missouri River, as compared to unharvested sites, like the lower Osage and Gasconade rivers.

"This was telling us that commercial harvesting may have already taken a toll on common snapping turtle populations in the Missouri River," Briggler said.

"What was clear throughout the study was that a substantial portion of turtles — on average 23 percent — could be harvested using legal methods," Briggler said. "Numbers obtained in this study indicated that commercial turtle harvesters had the potential to remove a sizeable proportion of harvestable turtle

populations under the state's regulations at that time."

Modeling of the population characteristics of these turtle species confirmed what turtle biologists already knew — turtle populations rarely can be harvested without a slow, steady decline occurring.

Given the traits that make turtles vulnerable to overharvest, research collected on the effects of harvest, and input solicited from commercial harvesters, citizens, and conservation organizations via a mail-in survey, MDC proposed eliminating commercial turtle harvest in July 2017. Those changes went into effect the following March.

"For years, turtles have survived their natural predators using their hard, protective shells and longevity to reproduce over many years, but harvesting for foreign markets is a battle they can't win in the long run," Briggler said. "I know this change will go a long way in the protection of the turtle resources of the state, and ensure Missouri's citizens will continue to see and utilize turtles in the future." ▲

A researcher catches and measures a turtle for a three-year study to better understand the effects of commercial harvesting on Missouri's turtle population.



Angie Daly Morfeld is the editor of the Missouri Conservationist. She loves Missouri turtles and always stops to help them cross the road.





EATING CLOSE TO HOME

LOCAVORES PUT EMPHASIS
ON FOODS' ORIGINS

by Larry Archer

Farmers markets are one place locavores get locally sourced foods. Hunting and fishing is another.

PHOTOGRAPH
BY NOPPADOL
PAOTHONG



M

MANY FAMILIES,

upon moving into a new home, personalize the property with some new landscaping. Janelle and Brad Sjue went beyond the typical shrubs and border annuals when they moved into their home in the Kansas City-area community of Brookline.

“When we bought our house, it was all asphalt,” Janelle Sjue said. “We had the asphalt ripped out, and then we were like, ‘Okay, we’re at ground zero,’ so we brought in dirt and decided to go with natives for planting to feed animals, initially.”

The native plantings for feeding nature soon evolved into raised garden beds and fruit trees for feeding themselves. And it continued.

“Then we decided there’s a whole circle of life thing going on here,” she said. “We got chickens to keep the bugs down instead of having to do pesticides. Of course, we benefitted from the eggs, and the kids had a lot of fun raising the chicks.”

Soon the Sjues and their four children, ages 7 to 16, were fully immersed in the culinary and social phenomenon known as the locavore movement.



The locavore lifestyle can include shopping regularly at farmers markets, harvesting your own protein through fishing and hunting, or foraging for wild-grown produce such as chanterelle mushrooms.

WHAT'S OLD IS NEW AGAIN

Commonly defined as people who mainly eat locally produced food, locavores range from those who shop extensively at local farmers markets to those who grow, forage, or harvest the majority of their own food. Motivation for those who adopt such a dietary lifestyle ranges as well, from supporting the local economy to seeking a better connection to the food they eat, said James Worley, an education specialist with MDC's Anita B. Gorman Conservation Discovery Center in Kansas City.

"People are concerned about where

their food comes from," Worley said. "They're very concerned about it being raised humanely, harvested humanely. They want it to be locally sourced. They want it to be free-range, non-GMO, organic. Wild fish and game fits the bill, fits all the definitions of what foodies are interested in when it comes to protein."

For the Sjues, the journey to the locavore lifestyle has been incremental, which intensified after they had children.

"It really was baby steps," said Janelle Sjue. "After we had kids we decided, 'Why are we putting chemicals on our yard and then letting our kids go out and play in

it.' And then we were like, 'How wise is it to have a yard?' And that's how we moved. What is the grass giving back to us, except keeping us out there mowing and raking? So that's kind of where we started, the idea of waste and — even our tiny little yard — using it wisely."

The process has been an educational one, with the family frequently taking advantage of the courses and resources offered at the Discovery Center, she said.

"We're learning as we go," she said. "We're urban people, so a lot of times we're scratching our heads over the solution to whatever the problem is."

“ People are concerned about where their food comes from. They want it locally sourced. They want it to be free-range, non-GMO, organic. **Wild fish and game fits the bill.**

—JAMES WORLEY,
MDC EDUCATION SPECIALIST

MDC Education Specialist James Worley fillets a buffalo fish, while Chef Jasper Mirabile Jr. prepares a dish from the evening's catch.



While the term “locavore” and the movement that bears its name is decidedly 21st Century, the idea of eating that which comes from local producers, from one’s own backyard, or from one’s last hunting or fishing trip has a much longer history, especially in Missouri’s rural communities.

Tom Modine, who lives in Kearney, north of Kansas City, was locavore before the term existed.

“We’ve always had huge gardens. That’s the way we grew up,” Modine said. “We grew all of our own vegetables or a large proportion of them. I grew up eating a lot of wild game meat.”

It’s a lifestyle Modine and his wife, Becky, have passed down to their three daughters, ages 11–21.

“They’ve grown up this way,” he said. “They’ve been butchering deer and ducks since they’ve been able to walk. It’s no big deal. And they’ve been cleaning fish and catching fish all that time, also.”

FROM FIELD TO FORK

On an evening last August, Brad Sjue and Tom Modine were two of nearly 40 guests at one in a series of what have become some of MDC’s most popular dinner parties. Called the Field to Fork series, the event draws heavily from the locavore community, Worley said.

“Our attendance here — this is about our third year of doing it — is about 50 percent foodies, people who are just wanting to try new game and fish and understand where wild game and fish come from and how it’s turned into dishes,” he said. “It’s about 25 percent young couples who are starting families, and they’re wanting to hunt and fish and provide fish and game for their families. And then it’s about 25 percent old timers who have been here and done that, and they’re looking for new ways to turn their fish and game into something beyond deer chili, fried fish, and jerky and sausage.”

The event also draws some of Kansas City’s most accomplished and innovative chefs to prepare wild game and fish. The goal is to introduce participants to the variety of ways to prepare these natural dishes, and move beyond the standard fare, said Worley.

“I love fried fish, and I love deer chili — who doesn’t? — but people want more now. Their palates are more adventurous, and they want to try new things,” he said. “They want it to be beautiful, and they want it to be delicious and incorporate local ingredients and unique ingredients and have different flavors and textures.”

Which is why, Worley explained, he reached out to the city’s culinary



Chef Jasper Mirabile Jr. prepares a deer backstrap for grilling.

community. But what brings some of the city’s most respected chefs out of their kitchens to prepare whatever Worley shoots, hooks, or snags? Opportunity and challenge, he said.

“They get to do something they don’t get to do in their restaurants. They get to cook fish you can’t sell, you can’t cook because of regulations, and they’re around people who are really appreciative,” Worley said. “There’s nobody here who’s not wanting what’s happening in this room. You get people in the restaurant who are not happy, but they don’t have anybody who’s not happy in here.”

Past programs have included familiar game, including venison, squirrel, and panfish, but this night’s menu challenged the guest chefs with buffalo fish, gar, and catfish. Chef Jasper Mirabile Jr., of Jasper’s Italian Restaurant, says these aquatic afterthoughts offer more than meets the eye.

“You’ve got this big ugly fish — and it’s an ugly fish — and 15 minutes later it’s as flaky as can be and just melts in your mouth,” he said. “I eat it right off the grill.”

In many cases, overcoming people’s perceptions is a bigger obstacle than turning the catch of the day into a culinary delight, he said.

“You hear people talk about catfish, ‘Ooo, I’m not going to eat it.’ The name itself, I guess,” he said. “If I didn’t tell anybody that it’s catfish, people would

Danielle Worley learns how to de-bone a deer she harvested and donated to the Field to Fork Program.





Venison Neck Italian Wedding Soup



Grilled Buffalo with Heirloom Tomato Jam and Pickled Banana Peppers

think, 'It's so flaky. It's so flavorful. What is this? What Mediterranean fish is this?' What Mediterranean fish? Come on, it's catfish. Missouri catfish."

Similarly, Chef Mickey Priolo and Chef Rick Mullins find opportunity and challenge in Worley's offerings, especially on this evening.

"This is part of why we love doing this with James Worley because he's always giving us these things we've never cooked with," said Mullins, who is the chef de cuisine at Gram & Dun in Kansas City. "I've never cooked with buffalo fish. This is not what you order from your fish purveyor at your restaurant."

Field to Fork not only offers the pair a challenge, it also offers them the opportunity to share their own passion for locally sourced food. Mullins and Priolo, who is the general manager of Café Sebastienne in Kansas City, are the founders of Soil

Collective, a cadre of area chefs applying culinary solutions to social issues. Under the Soil Collective banner, and working with other like-minded chefs, the two host dinners throughout the Kansas City area featuring only locally sourced foods, including wild ingredients they find.

"We forage for berries, mushrooms, wild herbs, wild onions, wild garlic, things like that," Mullins said.

The two see food, especially locally sourced food, as an avenue for addressing other concerns, including connecting local food producers with local restaurants, eliminating food waste, and combating hunger and unemployment.

"It's about us learning, growing, being good people," Priolo said. "And then trying to educate as well and trying to get people on board with the idea of let's treat everything better: the environment, ourselves, people around us."

Many young families, attracted to the locavore lifestyle as a way to encourage healthy eating and connect with nature, are among those attending MDC's Field to Fork programs, which help participants discover new ways to prepare locally harvested fish and game.

GETTING STARTED

While the Field to Fork events focus primarily on preparing fish and game, or the "fork" element of the program title, Worley uses the opportunity to encourage participants to explore the "field" as well — as active anglers and hunters.

"In the program, I talk about game populations," he said. "I talk about how fishing and hunting are methods we use to keep the populations at acceptable levels. Those levels are identified through research-based science, which is used to set seasons and limits.

"We get into methods of harvesting and locations, places to go around the metro area. Then we dive in."

Building on what they had learned in Field to Fork and the other consumptive classes taught by Worley, the Sjues have begun fishing and are preparing themselves to take the next step toward harvesting wild game of their own, Janelle Sjuje said.

Want to start fishing or hunting?

MDC's programs can help. Visit short.mdc.mo.gov/ZTW for information on getting started fishing and short.mdc.mo.gov/Z4q for help with hunting.



Smoked Gar with White Corn and Summer Squash Salad



Rigatoni fra Diavolo with Gar



Venison Carpaccio with Tuscan Kale Salad



“We’re trying to move to the next step. James is really working on getting people who are unfamiliar with harvesting animals,” she said. “Growing plants feels more comfortable than harvesting animals, so we’re starting to look at going to the next phase of hunting and fishing.”

That next step for the Sjuess has included attending MDC’s hunter safety course, family fishing outings, and mentored fishing trips with Worley, Brad Sjuess said.

“It’s been a really great educational experience,” he said. “My son and I went out with James on a fishing trip earlier this summer. We caught catfish, then learned how to skin and cook them. It was really great.”

That transition, from local consumers or home gardeners to active harvesters

of fish and wildlife, can be intimidating, especially for those without a family tradition of hunting and fishing, Worley said, but MDC is there to help.

“As a department, we have lots of clinics, classes, and opportunities to learn,” he said. “We have fishing clinics, hunting clinics, and mentored hunts, things like that.”

FOOD FOR THE SOUL

While there was unanimous agreement among the Field to Fork participants that wild fish and game, prepared by the right hands, is delicious and healthy, the upside of getting outdoors to hunt and fish goes beyond nutrition. Brad Sjuess sees his family’s move to the locavore lifestyle, including hunting and fishing, as providing additional social and

developmental benefits, especially for their children.

“What I really hope they get out of all of this is the desire to engage in their local communities, their local conservation areas, go spend time outside: fishing, hunting, exploring, hiking, being independent,” he said. “It gives them this sense of independence, playing in nature that most of us had growing up, but a lot of kids in the city don’t.” ▲

Larry Archer is an editor in MDC’s Outreach and Education Division and regular contributor of Missouri Conservationist’s monthly Places To Go section. He enjoys time outdoors and is converting his backyard into a pollinator and wildlife haven.



Halting the Horrible Hydrilla

A NEW INVADER THREATENS MISSOURI WATERS AND FISHERIES
by Bill Graham

Help MDC stop
the super-prolific
and harmful
aquatic plant.

PHOTOGRAPHS BY
DAVID STONNER



Hercules won his battle with Hydra, the mythical many-headed sea serpent. MDC aquatic biologists believe they can defeat hydrilla, an invasive water plant with many ways to reproduce and grow into thick mats that choke ponds, lakes, and rivers. But help is needed from anglers, boaters, and private pond owners to keep this new invasive threat at bay. Missouri's treasured fishing waters are at stake.



Still Time to Stop its Spread

Already, sharp-eyed citizens who spotted hydrilla and reported it to MDC have helped put the brakes on infestations found in the Springfield, Johnson County, and St. Louis areas. The green, whorled plant with serrated leaves has the potential to spread rapidly and ruin waters for anglers and boaters. In addition, hydrilla can harbor toxins that can kill waterfowl and raptors. Infestations can clog intakes for drinking treatment plants or irrigation equipment. Early detection can help MDC and property owners prevent hydrilla from becoming established. "Hydrilla can cost us a fortune, and it can ruin the fishery in many of our lakes," said Kenda Flores, MDC aquatic habitat specialist. "It can change things drastically."

Several invasive species, both plant and animal, on land and in water, are major threats to Missouri's fish and wildlife. Controlling them is a top priority in MDC's strategic plan.

Stopping hydrilla, however, is drawing special attention because the prolific, rampantly growing plant is among the most threatening to healthy fisheries and avian wildlife. Yet it's currently been found in only five Missouri counties, so there's still time to prevent millions of dollars in eradication costs and lost fishing opportunities for anglers.

A Complex Invader

The Eurasian native escaped from the aquarium trade and invaded Florida waters in the 1950s. Then hydrilla spread to other locations, including some large reservoirs in Southern states. The plant is especially fond of warm, clear water.

"Florida and Texas combined spend more than a billion dollars annually just to keep boat lanes open from launch ramps, so anglers and boaters can reach open water," Flores said.

The challenge is to stop a plant that can grow an inch a day and has multiple ways to sprout into new stands and reach new

waters. Hydrilla can sink roots and grow from the shoreline to water 30 feet deep. A new plant can sprout from small fragments of leaves and stems as well as seeds. Buds that grow at the leaf axil, called turions, can start new plants. So can potatolike tubers that grow on the roots. Turions and tubers can embed in mud and enable hydrilla to bounce back from winter. They pose the most problems for controlling hydrilla. The tubers are not killed by herbicides. Wildlife, floods, water current, boats, trailers, fishing tackle, and hunting gear such as decoys can all move hydrilla to new places. So can the illegal sale of hydrilla as an aquarium plant, or the accidental transfer of tubers or turions in soil with potted plants traded or sold for water gardens.

Other aquatic plants producing thick growth pose similar problems for ponds and lakes. Most of those native and nonnative plants can be controlled or eliminated in ponds and small lakes with one or two treatments. Once hydrilla gets established, however, treatments are needed for five years or more because the treatments will kill green vegetation but not tubers on the roots. Tubers can survive that long in a pond's gravel, sand, or mud sediment and produce new hydrilla plants.

Annual herbicide treatments to control hydrilla can cost from \$200 to more than \$2,000 per acre, said Kara Tvedt, MDC fisheries management biologist.

"It is very site-specific," Tvedt said. "Small ponds with limited water exchange can be treated with cheaper formulations and at lower rates. Sites with high water exchange rates and spot treatments in reservoirs require more expensive herbicide formulations and higher rates. Depth also plays a role in the amount of herbicide needed. As you would expect, deeper lakes have more volume, so more product is needed to achieve the desired herbicide rate."

Hydrilla in Missouri

Hydrilla was first discovered in Missouri in 2012 at a private 9-acre lake in Greene County. MDC and property owners are now monitoring 33 ponds or lakes in Greene County where hydrilla has been found. Two sites were found before tubers were produced and received one treatment. But 31 sites had tubers and are getting annual treatments. The invader has also been found at a private pond in Dallas County.

A few strands of hydrilla were found last July in the upper end of Fellows Lake, which serves Springfield's drinking water supply. Hydrilla was likely washed into the lake from a pond in the watershed by heavy rains during April 2017. MDC and City Utilities of Springfield responded quickly, and hopefully, they eliminated the plant before it had a chance to put down tubers. No tubers have been found thus far, which is encouraging, and the lake will get intense monitoring this summer.

MDC staff works with property owners to monitor waters in neighborhoods where hydrilla is found.

"You've got to try to find every spot of it and treat it because it moves so easily," Tvedt said.

One pond in Greene County likely got hydrilla from people dumping fish, plants, and water out of aquariums they no longer wanted, Tvedt said. At another pond, the previous owners fished in Southern states where hydrilla is common. It's possible the owners returned with the plant clinging to their boats or equipment. Some infestations may have started from tubers in soil around potted plants like water lilies placed in ponds.

In Warren County, hydrilla was discovered in a subdivision pond. It was likely introduced from tubers in soil with potted water lilies purchased for the pond. In a separate case, a business in St. Louis County was found selling hydrilla as a water-garden plant with a sales pitch that it adds oxygen to water. Hydrilla is a federally listed noxious weed in the United States, which means it is illegal to sell or plant it. The U.S. Department of Agriculture Animal and Plant Health Inspection Service contacted the business and halted the sales.

The soil for potted water garden plants purchased or traded can sometimes contain hydrilla tubers or seed-like turions that start hydrilla infestations. Properly dispose old soil, clean to bare root, and repot with clean soil.



DAVID STONNER



KARA TVEDT

Don't Dump Aquariums or Bait, and Always Clean Your Gear

Dumping unwanted aquariums and bait buckets into ponds, lakes, or streams spreads invasive species. Take care to clean, drain, and dry all watercraft and gear when moving from one body of water to another. This practice can halt the spread of all invasive aquatic species, including zebra mussels, Asian carp, and various unwanted aquatic plants.

To learn more about invasive species, visit short.mdc.mo.gov/Z5L.



Herbicide to kill hydrilla can be applied from boat or by shore, depending on the depth and size of waters being treated.

Report and Control Hydrilla

Learn what the plant looks like, and if you find it, please email several in-focus, close-up photos to hydrillareporting@mdc.mo.gov. For hydrilla identification and prevention tips, visit short.mdc.mo.gov/ZTr.

MDC staff can help you plan a strategy to eliminate hydrilla from your pond or lake. They also monitor treatment sites, including sampling sediment and looking for tubers that can sprout new plants. In addition, they monitor creeks and streams where ponds have hydrilla. The goal is to ensure that heavy rains don't flush hydrilla into streams and cause infestations.

In 2016, a citizen helped discover an accidental hydrilla infestation at a lake at Powell Gardens, a nonprofit botanical garden east of Kansas City in Johnson County. That summer, the person had seen an MDC invasive species display at the Missouri State Fair. The citizen realized hydrilla was growing at Powell Gardens and notified garden staff. The invader apparently arrived in water lilies purchased as potted plants and placed in the lake two or three years prior.

"It was a warning sign to us that we need to be more vigilant in the future," said Kalie Hudson, Powell Gardens manager for marketing and sales. "It was definitely a surprise."

MDC urges people purchasing aquatic plants for a water garden or pond to clean all roots and discard any soil from pots. People should plant bare-root plants in a pond, or if a pot is used, replace the soil with clean material.

Similar care is needed for aquariums. When discarding aquarium fish and plants, they should never dump them into ponds or lakes. Sparing a few exotic fish and plants can destroy the quality of a native fishery. Place unwanted aquarium plants, soil, sand, or gravel in a bag and freeze for at least two weeks before disposing in trash. Do not compost this material.

Hydrilla covered much of Powell Garden's main lake when treatments began, said Trish Yasger, MDC fisheries management biologist. The herbicide was applied from a boat at the lake and from the shore at two nearby ponds.

"There was not a lot of open water," Yasger said of the main lake. "We were trying to apply the chemical. The hydrilla kept



clogging the trolling motor, and it was hard to paddle through. It was just thick.”

MDC sent letters to landowners in the area alerting them that hydrilla was found in the neighborhood. MDC staff will regularly check the streams in the area, and biologists are willing to inspect ponds if property owners think hydrilla might be present.

“We looked at several ponds last year, and none of them had hydrilla — thankfully,” Yasger said.

Protecting our Waters

Anglers and other recreationists can help stop movement of aquatic invasive species, including other plants or zebra mussels, by draining, cleaning, and drying boats, motors, and trailers. The same for fishing and hunting gear. Waterfowl hunters need to make sure plants don’t move on gear such as decoy lines and weights or that tubers move on muddy boots. Precaution and prevention are easier and far more affordable than treatments. MDC staffers power wash boats with hot water after applying treatments in lakes or ponds that have hydrilla or other invasive species.

“If you launch a boat in water and pull it out, it’s important to get all the vegetation off the boat and trailer,” Yasger said.

Anglers should never move hydrilla on purpose. At large reservoirs in Southern states, largemouth bass are often caught near hydrilla mats. But that’s often because the open water on the edges of those mats is the only place where anglers can fish.



It’s always good to clean, drain, and dry boats and gear to halt the spread of invasive species. But it’s especially critical when waters are infested with an invader.

Also, studies have found that the average weight of largemouth bass decreases by 30 percent in impoundments with hydrilla, Tvedt said. The thick growth blocks so much sunlight that less food is produced at the bottom of the food chain and bass have less to eat.

“Studies have shown hydrilla causes a decrease in the average size of fish,” Tvedt said.

In Southern states, hydrilla has also been found to harbor a type of cyanobacteria, or blue-green algae, that is toxic to waterfowl and birds of prey, such as bald eagles, that eat them. University of Georgia researchers found the cyanobacteria that causes avian vacuolar myelinopathy and named it *Aetokthonos hydrillicola*. The translation from the scientific name means eagle killer that lives on hydrilla. Avian vacuolar myelinopathy was first identified in Arkansas in 1994 after being tied to eagle deaths. The toxin causes unique holes in the brain and spinal cords of the birds, impairing their walking, swimming, and flying, and eventually causing death. Despite hydrilla’s ability to spread in multiple ways and cause a variety of problems, MDC and conservation partners — including outdoor enthusiasts — are doing all they can to stop its spread in Missouri.

“If we can catch it early and get it under control and halt its movement, we have a shot,” Tvedt said. “We have a good shot.” ▲

Bill Graham is MDC’s Kansas City Region media specialist. He’s a lifelong hunter, angler, and camper who also greatly enjoys hiking and photography in Missouri’s best wild places.

Get Outside

in MAY → Ways to connect with nature



Peek-a-boo

Opossum young begin emerging from their mother's pouch.



American robin

Location, location, location

Got some new neighbors of the fine-feathered variety? If so, it's not surprising this time of year. Bird nesting is at its peak. Look for meadowlarks, robins, orioles, bobolinks, and eastern bluebirds building new homes.

Nature's chorus

Two species of frogs are out and calling in chorus. The **cricket frog's** call sounds like small pebbles being struck rapidly together. Not to be outdone is the **gray treefrog**, which has a musical, birdlike trill.



NORTHWEST REGION

OUTDOOR SKILLS CAMP: Introduction to Archery

Thursday, May 24 • 6-7:30 p.m.
Pigeon Hill Conservation Area
701 James McCarthy Drive,
St. Joseph, MO 64507
Registration required, call 816-271-3100
Ages 12-18

New to archery? This is the class for you! Bows, arrows, and targets will be provided. Anyone under 15 must be accompanied by an adult.

Natural Events to See This Month

Here's what's going on in the natural world.



Ring-necked pheasant crowing at its peak



Carpenter bees lay eggs in wood



Common nighthawks flit over cities eating insects at dusk

Find more events in your area at mdc.mo.gov/events

SOUTHEAST REGION

ENDANGERED SPECIES: The Hidden Gems of Missouri

Saturday, May 19 • 1-2:30 p.m.

Cape Girardeau Conservation Nature Center

2289 County Park Drive, Cape Girardeau, MO 63701

No registration required, call 573-290-5218 for information | All ages

Missouri is home to many different species of plants, but some are classified as endangered or rare. Join a naturalist in learning about some of Missouri's uncommon gems and their place in our natural landscapes.



Western prairie
fringed orchid



Enjoy the light show

Fireflies — or lightning bugs — set the night sky aglow on warm evenings.



In full bloom

Missouri's landscape is in bloom this time of year. Find the large yellow flowers of **Missouri primrose** on Ozark glades. The purple blooms of the **coneflower** and the bright yellow heads of **tickseed coreopsis** dot the prairies and roadsides. What native flowers can you find?



Missouri primrose

Purple
coneflowers

Tickseed coreopsis



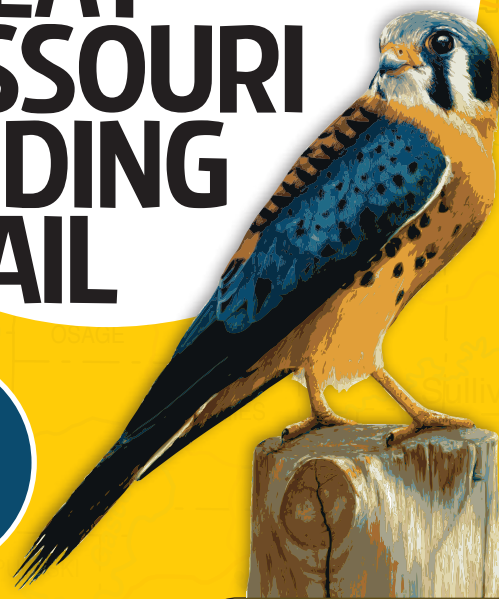
Black bears
eat grass and
other plants
to reactivate
their digestive
systems



Bluegill
begin
spawning



DISCOVER NATURE *on the* GREAT MISSOURI BIRDING TRAIL



Strap on your binoculars, grab your field guide, and head out for an exciting day of birding.

The **Great Missouri Birding Trail** is an online interactive map of the best places to bird in the state to introduce new and seasoned birders to over 335 bird species that annually visit Missouri. Let's go birding!



THE TRAIL IS DIVIDED INTO SIX REGIONS, INCLUDING ST. LOUIS, CENTRAL, KANSAS CITY, SOUTHWEST, SOUTHEAST, AND NORTHEAST.



Visit greatmissouribirdingtrail.com to find birding locations near you and what birds you may see, driving directions, information on Missouri's diverse habitats, and much more.

Places to Go

KANSAS CITY REGION

Baltimore Bend Conservation Area

A series of unfortunate events results in fortunate outdoor opportunities

by Larry Archer

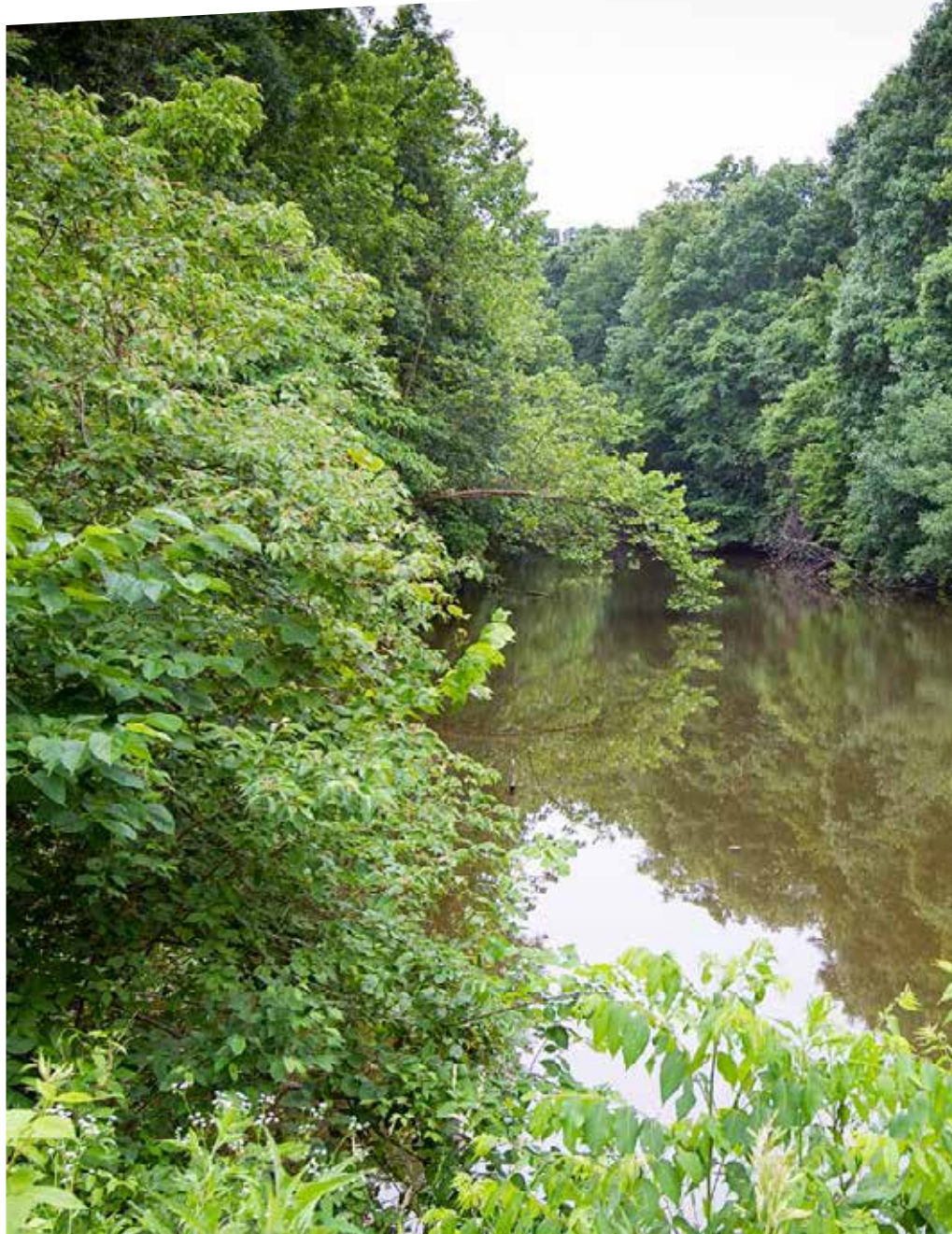
✕ **Born of one disaster, named for another,** and neighbor to the product of yet a third, one might be tempted to compare Baltimore Bend Conservation Area (CA) to the wildly unlucky Baudelaire siblings of Lemony Snicket's popular children's book series, *A Series of Unfortunate Events*.

Created by the glacial movements of the Ice Age, Baltimore Bend CA derives its name from the Baltimore, a 19th century riverboat that ran aground and sank in the nearby Missouri River. The 1,202-acre area abuts the 1,748-acre Baltimore Bottom Unit of the U.S. Fish and Wildlife Service's Big Muddy National Fish and Wildlife Refuge, which was developed following the Great Flood of 1993.

That first "disaster," the Ice Age, gave the area its rugged terrain and soils that foster the growth of the hardwood forests that cover 80 percent of the area, according to Resource Forester David Doyle, Baltimore Bend CA manager.

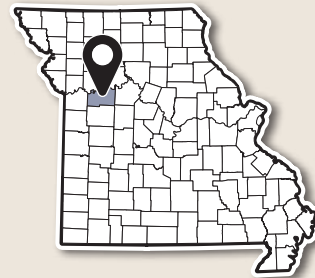
"During the Ice Age, that wind-blown soil would accumulate against the Missouri river, and it just built up," Doyle said. "That's why the terrain is so jagged, but the fertility is astronomical."

The combination makes the area a destination for turkey and deer hunters, as well as birders and hikers looking for more of a challenge.



With five ponds on more than 1,200 acres, Baltimore Bend CA supports a variety of wildlife. Although primarily forested, the area also has scattered grasslands, where wildflowers, such as these black-eyed Susans, can be found beginning to bloom in the spring.

BALTIMORE BEND: DAVID STONNER



BALTIMORE BEND CONSERVATION AREA

consists of 1,202 acres in Lafayette County.
From Waverly, take Highway 24 west 3 miles.

N39° 43' 44.75" | W91° 24' 45.25"
short.mdc.mo.gov/Zqk 816-228-3766

WHAT TO DO WHEN YOU VISIT



Bird-Watching Included in the National Audubon Society's West-Central Missouri River Bends Important Bird Area. The eBird list of birds recorded at Baltimore Bend CA is available at short.mdc.mo.gov/ZqZ.



Camping Primitive camping only. No amenities provided.



Fishing Black bass, white bass



Hunting

Deer and turkey

Deer and turkey regulations are subject to annual changes, so refer to the *Spring Turkey* and *Fall Deer and Turkey* booklets for current regulations.

Dove, Quail, Rabbit, and Squirrel



Trapping Special use permit required.

"If you get up on the hills and you're right above the railroad tracks, you can see across the Missouri River. If you're looking north, you can see the river bottoms overlooking Baltimore Bottoms wildlife refuge."

—Baltimore Bend CA Manager David Doyle

WHAT TO LOOK FOR WHEN YOU VISIT



Bobcat



Barred owl



Luna moth



Indigo bunting



Bicolored Striped Sweat Bee

Agapostemon virescens

Status	Size	Distribution
Common in May	0.3–0.6 inches	Statewide



Did You Know?

Sweat bees are famous — or infamous — for their tendency to land on humans to obtain moisture and salts from perspiration. Like deer visiting a salt lick or an athlete drinking an electrolyte beverage, they supplement their diet with salts, which they sometimes try to obtain from sweating humans. Though they share the same moniker, bicolored striped sweat bees don't share the same affinity for human sweat.

Bicolored striped sweat bees are among the most strikingly noticeable of our native bee species with their metallic green or blue-green sheen and exotic mix of colors. The females are fast flyers and have a black abdomen with thin white stripes. The males tend to fly more slowly while searching for females in the garden and have thick bands of yellow stripes on their abdomens.



LIFE CYCLE

Bicolored striped sweat bees dig nests deep in flat or sloping soil or sometimes in banks. They are typically a communal species, sharing the same nest entrance. Up to 12 females may share a single nest, but each individual builds her own brood cells where she can lay her eggs. In cool regions, there is one generation per year, with females active in early summer and males in late summer. Only mated females survive through winter.



FOODS

Larvae, developing in underground nests, eat from a mass of pollen and nectar provided to them when their eggs are laid. Adults, like other bees, eat nectar and pollen, pollinating flowers in the process. Bicolored striped sweat bees are generalists when it comes to flowers. However, they are short-tongued and have difficulty extracting nectar from deep flowers.



ECOSYSTEM CONNECTIONS

Adults gather pollen and are considered beneficial pollinators.

Outdoor Calendar

❖ MISSOURI DEPARTMENT OF CONSERVATION ❖



FISHING

Black Bass

Impounded waters and non-Ozark streams:
Open all year

Most streams south of the Missouri River:
May 26, 2018–Feb. 28, 2019

Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2018

Nongame Fish Giggling

Impounded Waters, sunrise to sunset:
Feb. 1–Sept. 14, 2018

Streams and Impounded Waters,
sunrise to midnight:
Sept. 15, 2018–Jan. 31, 2019

Paddlefish

Statewide:
March 15–April 30, 2018

On the Mississippi River:
March 15–May 15, 2018
Sept. 15–Dec. 15, 2018

Trout Parks

Catch-and-Keep:
March 1–Oct. 31, 2018

Catch and Release:
Nov. 9, 2018–Feb. 11, 2019

Buy Permits and Permit Card

Buy Missouri hunting and fishing permits from numerous vendors around the state, online at mdc.mo.gov/buypermits, or through our free mobile apps, MO Hunting and MO Fishing. Permit cards are an additional way to show proof of most permits. Buy a new permit card for a one-time fee of \$2 at mdc.mo.gov/buypermits. Buyers can select from four images: bass, buck, bluebird, or mallard duck.



HUNTING

Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2018

Coyote

Restrictions apply during April, spring turkey season, and firearms deer season.

Open all year

Crow

Nov. 1, 2018–March 3, 2019

Deer

Archery:

Sept. 15–Nov. 9, 2018

Nov. 21, 2018–Jan. 15, 2019

Firearms:

► Early Youth Portion (ages 6–15):
Oct. 27–28, 2018

► November Portion:
Nov. 10–20, 2018

► Late Youth Portion (ages 6–15):
Nov. 23–25, 2018

► Antlerless Portion (open areas only):
Nov. 30–Dec. 2, 2018

► Alternative Methods Portion:
Dec. 22, 2018–Jan. 1, 2019

Groundhog (woodchuck)

May 7–Dec. 15, 2018

Pheasant

Youth (ages 6–15):

Oct. 27–Oct. 28, 2018

Regular:

Nov. 1, 2018–Jan. 15, 2019

Quail

Youth (ages 6–15):

Oct. 27–Oct. 28, 2018

Regular:

Nov. 1, 2018–Jan. 15, 2019

Rabbit

Oct. 1, 2018–Feb. 15, 2019

Squirrel

May 26, 2018–Feb. 15, 2019

Turkey

Archery:

Sept. 15–Nov. 9, 2018

Nov. 21, 2018–Jan. 15, 2019

Firearms:

► Spring: April 16–May 6, 2018

► Fall: Oct. 1–31, 2018

Waterfowl

See the Waterfowl Hunting Digest or visit short.mdc.mo.gov/ZZx for more information.

Regulations Booklets Available

Get MDC's latest information on hunting, trapping, and fishing. Find *A Summary of Missouri Hunting and Trapping Regulations* at short.mdc.mo.gov/ZZf and *A Summary of Missouri Fishing Regulations* at short.mdc.mo.gov/ZUK. Both publications are available in print where permits are sold.



ILLUSTRATION: MARK RATHIEL

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code of Missouri* at short.mdc.mo.gov/Zib. Current hunting, trapping, and fishing regulation booklets are available from local permit vendors or online at short.mdc.mo.gov/ZZf.



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Wood ducks are common summer residents in Missouri. Look for them hanging near the water — ponds, streams, lakes, and swamps. Male wood ducks, like the one pictured here, are stunning with their iridescent chestnut and green plumage and ornate patterns on nearly every feather. Go out and discover more of Missouri's breeding birds this summer!

📷 by **Noppadol Paothong**

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